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(54) Abstract Title
 Self-service terminal

(57) A self-service terminal (114a,b) for dispensing electronic vouchers (52 , Fig 2) for storing in a portable terminal (118) is described. The voucher (52) comprises a description (62, Fig 3) of the voucher in a natural language, such as English; and a description (64, Fig 3) of the voucher in an artificial language, such as a numeric representation of a barcode, so that the voucher (52) is readable by a human and also by an electronic device.

The SST has a wireless port such as ir to download the electronic coupons to the portable terminal (118) which is preferably in the form of a PDA. Preferably, the PDA has a CPU (212) with a non volatile memory (216), a simple operating system (226) and a voucher management program (228). The portable terminal can also be a cellular telephone and/or receive electronic money from a SST in the form of an ATM to allow it to be used for payment also. Vouchers can be automatically downloaded to the PDA when the user requests other information such as a bank statement. In an further embodiment, the portable terminal is in the form of a Smart device (18, Fig 1) such as a card. The SST's maybe connected via the internet such that the vouchers can be downloaded via a web browser (Fig 4) enabling control of the numbers of vouchers issued (Fig 5).

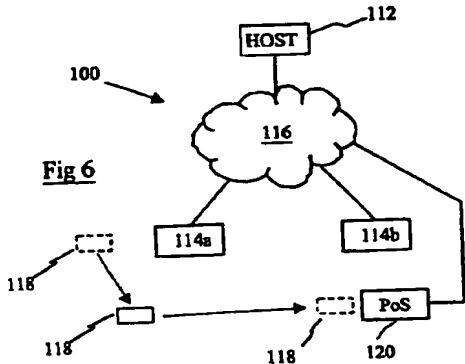


Fig 6

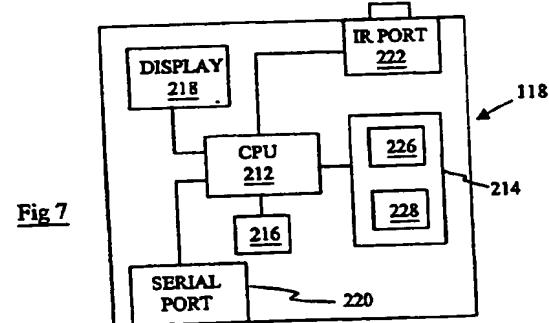


Fig 7

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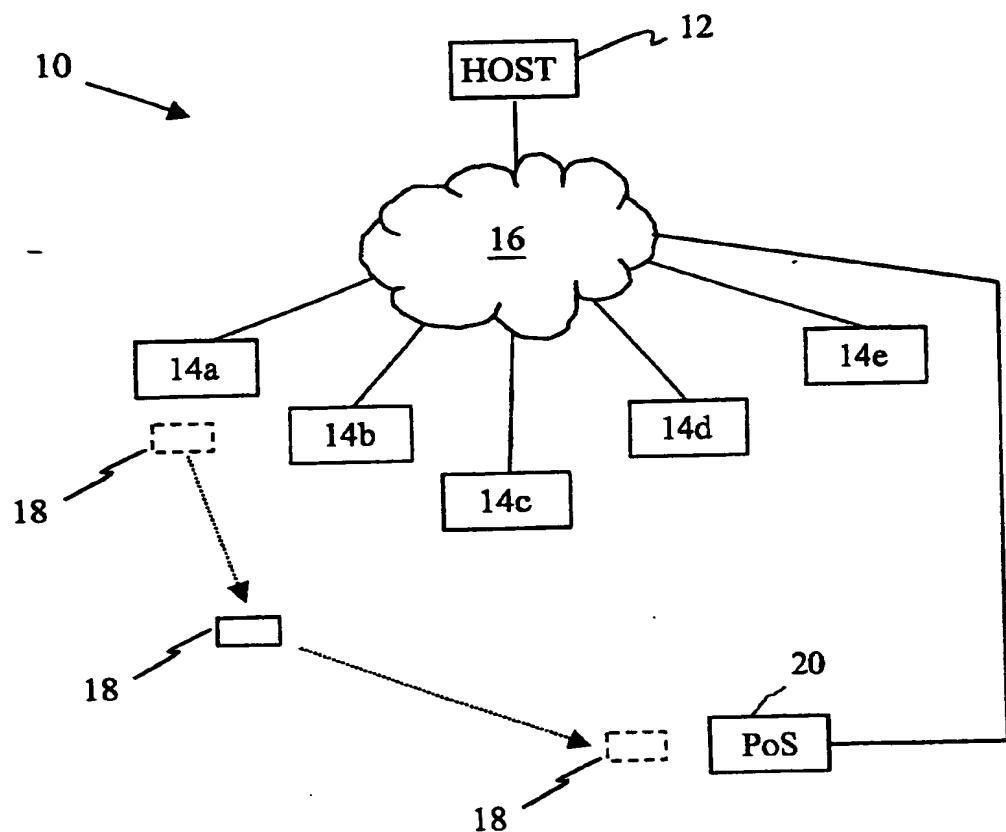


Fig 1

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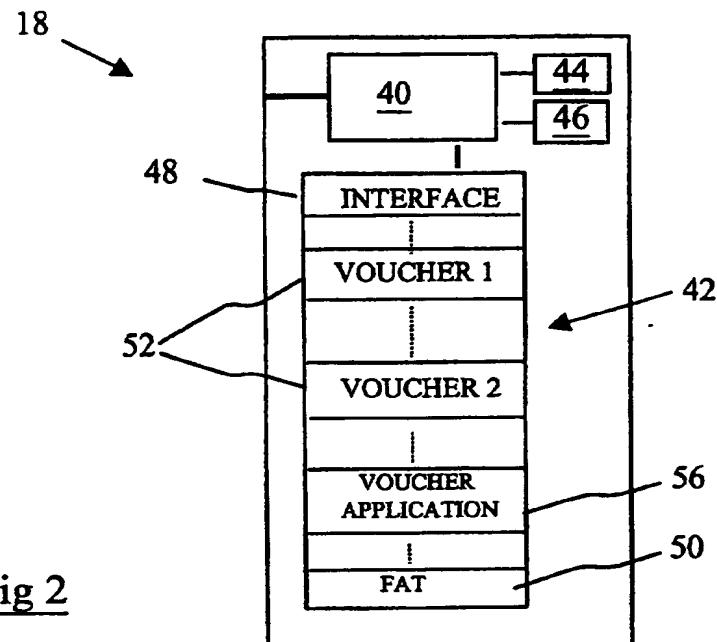


Fig 2

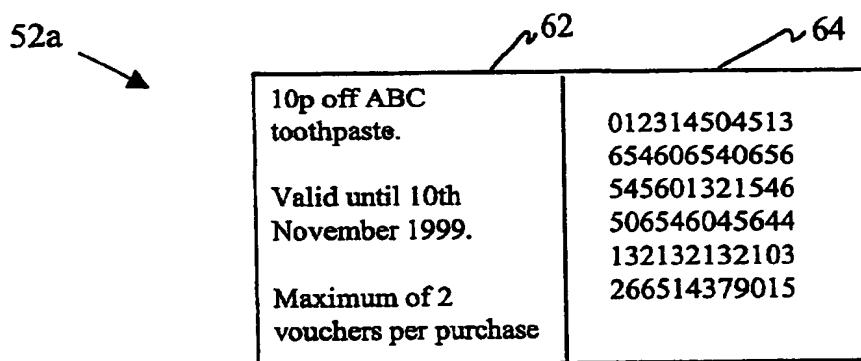
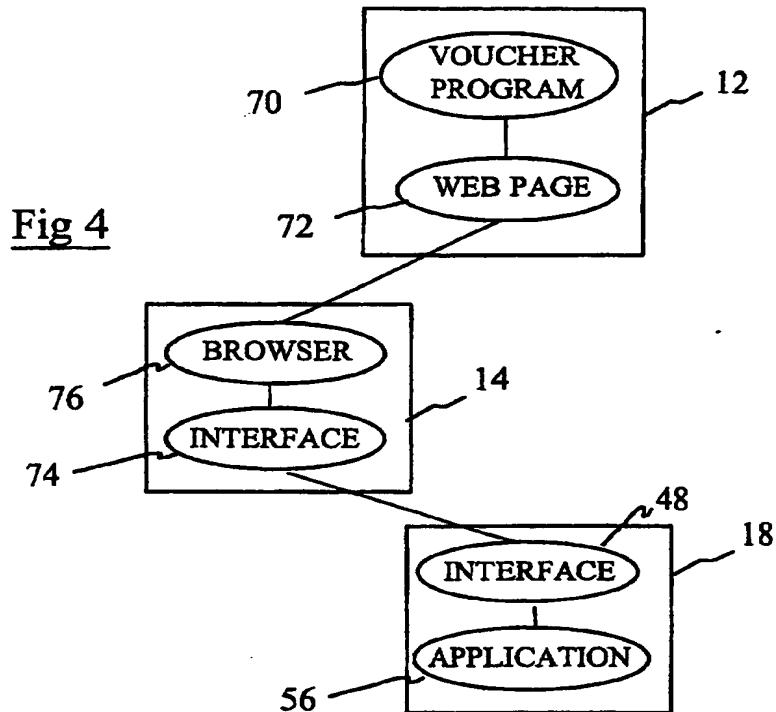


Fig 3

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82 84 86 88 90

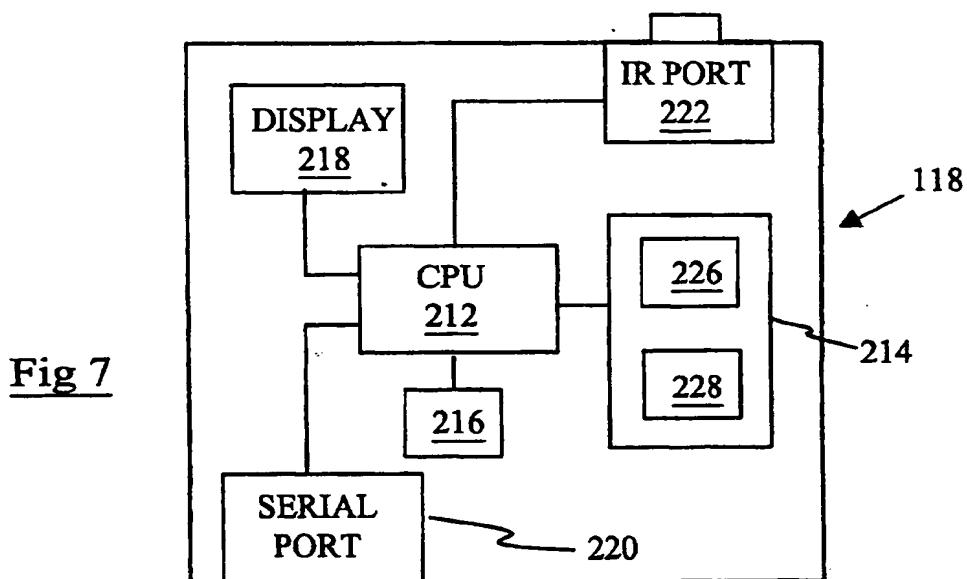
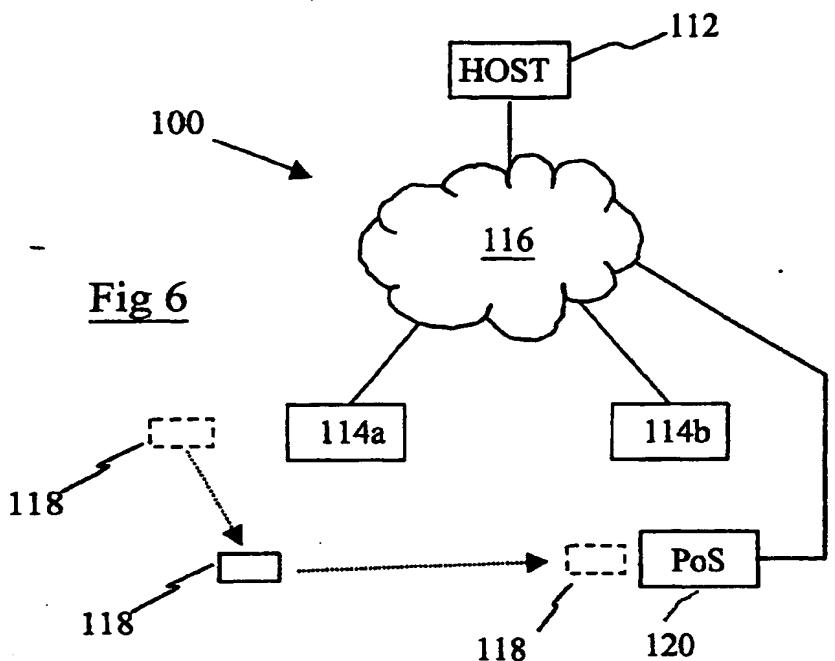
↓ ↓ ↓ ↓ ↓

TYPE	IDENTIFIER	ISSUED AT	ISSUED TO	REDEEMED
ABC044	0000	08:11:99:14:25:58	124.25.49.145	NO
ABC044	0001	08:11:99:14:34:23	124.25.49.145	YES
ABC044	0002	08:11:99:14:48:23	124.25.49.56	NO
ABC044	0003	08:11:99:15:02:12	124.25.49.145	NO

Fig 5

80

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SELF-SERVICE TERMINAL

The present invention relates to a self-service terminal (SST) such as an automated teller machine (ATM). In particular, the SST relates to an ATM for dispensing vouchers.

A retail voucher is typically a paper-based coupon that grants the holder of the voucher a special offer in relation to one or more products or services on presentation of the voucher. Such vouchers may be redeemable against a particular product (for example, a particular brand of toothpaste) either to obtain a discounted price (for example, a ten pence reduction in the purchase price) or some special product configuration (for example, three products for the price of two products).

Manufacturers and retailers use voucher campaigns at various times in a product's life cycle to increase sales and to build brand allegiance. The special offers provided by vouchers are intended to attract the purchaser to the product in the hope that the customer will continue to purchase the product once the financial incentive has been removed. The voucher system can be used equally well in low value, commodity products (such as soft drinks and soap powder) as in high value, special purchases (such as holidays).

Paper vouchers can be printed on cartons, newspapers and magazines or distributed as inserts in mail items. Self-service terminals (SSTs), such as automated teller machines (ATMs), dispense targeted vouchers, typically printed on the back of receipts. This is particularly common for ATMs located in small retail outlets where the proprietor of the

outlet may wish to provide specific special offer campaigns (for example, to reduce inventory).

Typically the redemption process for a voucher involves a customer submitting the paper voucher as part payment for the corresponding product at the time of purchase. For a money-off voucher the retailer deducts the value printed onto the voucher from the regular price of the product. The paper voucher is then retained by the retailer so that the retailer can be reimbursed by the issuer of the vouchers.

Although the concept of retail vouchers has obvious advantages for the consumer, retailer, and product manufacturer alike, the use of a physical medium, such as paper, to represent this token of value has a number of disadvantages.

The consumers must manage the vouchers they wish to use. They may initially obtain the vouchers by cutting them from cartons, newspapers, or the like, or they may receive them via the mail or by hand. They may also receive them from ATMs and other SSTs in the form of printed receipts or dispensed media. In all cases, the consumer is required to carry the physical token of value embodied in the voucher so that they can subsequently redeem it. When shopping, the consumer must remember which vouchers they have available and which products these vouchers relate to. They are also responsible for ensuring that the vouchers are valid for a given purchase: typically, each voucher has various exclusions and a date of expiry associated with it.

Retailers who accept these vouchers are required to check their validity with regard to expiry dates and applicability to the products presented. On some vouchers

this is facilitated by the use of barcodes, allowing the voucher to be scanned into the retail point-of-sale (PoS) terminal in the same manner as the barcodes for products are scanned. The PoS terminal software can then perform the product applicability checking automatically. There is still an onus, however, on the consumer and the retailer to use the appropriate vouchers for a given set of products and it is possible for errors of duplication or omission to occur.

Retailers are required to forward redeemed vouchers to the voucher issuing organisation so that the retailer can be compensated for the loss in revenue incurred by accepting the voucher as part payment for goods. The logistics associated with collecting vouchers from a chain of retail outlets or for multiple independent retailers to send the vouchers to the issuer can be complex.

Another problem is the outstanding liability for the issuer: the issuer must balance the number of vouchers that are printed against the estimated percentage of vouchers that will be redeemed. For national campaigns, where mass media channels (such as newspapers and magazines) are used to disseminate vouchers, the percentage of vouchers that are redeemed is generally quite low. However, if the voucher campaign is considerably more popular than anticipated, the issuer may have a huge liability.

Yet another problem is the time delay between issuing the vouchers and all of the redeemed vouchers being returned to the issuer. This means that the voucher issuer may not know the total liability until long after the voucher campaign has finished.

According to a first aspect of the invention there is provided a self-service terminal for dispensing electronic vouchers, the terminal having a communication port for wireless transmission of electronic vouchers to a portable terminal operated by a user.

By virtue of this aspect of the invention, an SST is able to transmit electronic vouchers to a user in a contactless manner.

Preferably, the self-service terminal is operable to transmit a voucher together with information requested by the user. For example, the SST may be an ATM that transmits a voucher with every statement that is requested by a user.

Preferably, the voucher is configured to be displayed on the user's portable terminal when the user views the requested transmitted information.

Preferably, the voucher is configured to delete itself automatically from the user's portable terminal if not redeemed before a predetermined date or time, or within a predetermined time period.

According to a second aspect of the invention there is provided a retail voucher system comprising: a voucher issuing terminal for issuing electronic vouchers; a portable voucher storage terminal for storing electronic vouchers; and a voucher receiving device for receiving electronic vouchers from portable voucher storing terminals; whereby, in use, a user transfers a retail voucher from the issuing terminal to the storage terminal and subsequently redeems the stored voucher at the voucher receiving device.

Preferably, the voucher receiving device is operable to communicate with the voucher issuer to provide the issuer with details of the vouchers that have been redeemed.

Preferably, the portable terminal is used for temporarily storing electronic vouchers, and has a control program for deleting those vouchers that have not been redeemed prior to their expiry date.

- The voucher issuing terminal may create an electronic voucher. Alternatively, the voucher issuing terminal may download an electronic voucher from a voucher creating device.

By virtue of this aspect of the invention, the voucher issuer can distribute vouchers using electronic delivery channels, thereby avoiding the expense of printing and delivering paper-based vouchers. This system also provides the voucher issuer with a simple way of collecting vouchers from retail outlets. This system has the further advantage of enabling the issuer to issue vouchers that are valid for a very short time period, for example two hours. A further advantage of this system is that the issuer can stop issuing vouchers at any time (for example, if the redemption rate of the vouchers is very high), thereby limiting any further financial liability.

According to a third aspect of the invention there is provided a method of managing retail vouchers, the method comprising the steps of: creating an electronic retail voucher, offering the electronic retail voucher to users, transferring the created electronic retail voucher to a user in response to a request for the voucher from that user, maintaining a record of the electronic retail vouchers that

have been transferred, maintaining a record of electronic retail vouchers that have been redeemed, and providing information relating to the number of electronic retail vouchers that have been transferred but have not been redeemed.

Preferably, the method includes the further step of ceasing to offer a retail voucher to users when a predetermined number of vouchers have been transferred and/or redeemed.

According to a fourth aspect of the invention there is provided a retail voucher management system comprising a voucher creating device for creating electronic retail vouchers, the device being interconnected to one or more voucher issuing terminals; whereby a user may download an electronic voucher from a voucher issuing terminal, and where the voucher creating device records the number of vouchers issued by the terminals.

Preferably, the system further comprises one or more voucher receiving devices that are interconnected to the voucher creating device for communicating details of any redeemed vouchers to the voucher creating device.

Preferably, the voucher receiving devices are point of sale (PoS) terminals.

The voucher creating device may create a single master voucher and a plurality of unique identifiers, and communicate this master voucher and a different subset of the unique identifiers to each voucher issuing terminal, so that each terminal can issue a voucher having a unique identifier without further recourse to the voucher creating device.

Alternatively, for each voucher issue request, the terminals may have to request a unique voucher from the voucher creating device.

According to a fifth aspect of the invention there is provided a method of supplying a user with retail vouchers, the method comprising the step of selectively transmitting one or more electronic vouchers to the user so that the user can use the transmitted electronic voucher or vouchers for purchasing a product or services.

The method may include the further steps of: for each user, maintaining a database of products and/or services that the user may be interested in purchasing; and, referring to the database to select the one or more electronic vouchers.

By virtue of this aspect of the invention, target marketing can be used to send vouchers directly to potential customers.

According to a sixth aspect of the invention there is provided a voucher issuing terminal, the terminal being arranged to receive a portable terminal storing one or more electronic retail vouchers, the voucher issuing terminal having a user interface for displaying the vouchers stored on the portable terminal.

The voucher issuing terminal may include a web browser facility for allowing the user of the portable terminal to view a web page referenced by a voucher stored in the portable terminal. The web page may display the terms and conditions for using the voucher.

The voucher issuing terminal may be operable to receive vouchers from the portable terminal in exchange for vouchers stored in the voucher issuing terminal.

The voucher issuing terminal may alert the user regarding any vouchers that are near to their expiry date.

It will be appreciated that one or more of the above described disadvantages are alleviated by using a virtual voucher (an electronic voucher) instead of a physical voucher such as a paper voucher. By using an electronic voucher, a voucher is only created when it is requested by a user: in contradistinction, with paper-based vouchers, a voucher is printed and valid even if no user requests the voucher. This means that the number of un-redeemed paper vouchers will typically be much higher than the number of un-redeemed electronic vouchers.

In one embodiment the virtual voucher takes the form of an electronic data structure that can be created, transmitted, stored and managed by the appropriate electronic systems associated with the issuer, consumer, and retailer.

The natural language description may be a simple explanation of the voucher's purpose (for example, '10p off a Soft Drink'). The artificial language description may have a Web based URL that provides access to the appropriate Terms and Conditions (for example, 'www.SoftDrink.com/offer.html').

There are many ways to store dates (number of seconds since the year 1970, DD-MM-YYYY:hh:mm:ss, or such like). Any convenient mechanism for implementing the expiry date may be chosen. When the expiry date is presented to a human user it is translated to an appropriate format.

According to a seventh aspect of the invention there is provided an electronic retail voucher for storing in a portable terminal, the voucher comprising a description of one or more properties of the voucher in a natural language, and a description of one or more properties of the voucher in an artificial language, so that at least part of the voucher is readable by a human and at least part of the voucher is readable by an electronic device.

It will be appreciated that the term electronic retail voucher is used to include a coupon, certificate, ticket, or other token that is stored in electronic format and that is used for granting the holder a special deal in relation to a product or service offered by a retailer.

The artificial language may be a computer language such as JAVA, C++, HTML, XML, or such like. Alternatively, the artificial language may be a barcode representation. The natural language may be English, German, French, Japanese, or such like.

Preferably, the electronic retail voucher is suitable for storing on a Smart card, a personal digital assistant, or a cellular telephone.

Preferably, the description of one or more properties of the voucher in an artificial language includes a unique identifier. One advantage of having a unique identifier associated with each voucher is that the issuer of the voucher may be able to correlate where the voucher was issued with where the voucher was redeemed, thereby providing the issuer with valuable marketing information for use in other voucher campaigns. Another advantage of having a unique identifier associated with each voucher is that the number of

vouchers issued may be recorded. Another advantage is that any fraudulent copying of the electronic voucher may be detected.

Preferably, the description of one or more properties of the voucher in a natural language includes one or more of the following details: the terms and conditions of the offer provided by the voucher, the expiry of the voucher, the value of the voucher. The description in a natural language is typically read using a display associated with the portable terminal.

By virtue of this aspect of the invention, a consumer may carry multiple vouchers ~~in a portable terminal~~ without risk of misplacing or damaging the vouchers. As the vouchers are electronic, the vouchers can be emailed directly to users. The electronic vouchers may also be transferred directly to a PoS terminal when a product is being purchased.

According to an eighth aspect of the invention there is provided a portable terminal comprising a controller, a display, a wireless communication port, and an input device, characterised in that the portable terminal includes a voucher manager, whereby, the manager is operable to receive an electronic voucher from a self-service terminal, to present a graphical representation of the voucher on the display, and to transmit the voucher using the wireless communication port.

The input device may be a keypad, a touch-sensitive panel mounted on the display, a microphone for receiving voice commands, or any other convenient input device.

It will be appreciated that the voucher manager is operable to redeem the voucher in response to a signal received from the input device.

Preferably, the voucher manager deletes a voucher once that voucher has been redeemed. This has the advantage that a voucher cannot be redeemed twice.

Preferably, the voucher comprises a description of one or more properties of the voucher in a natural language, and a description of one or more properties of the voucher in an artificial language. The advantage of this feature is that at least part of the voucher is readable by a human, which allows a user to recognise what goods or services the voucher can be used for; and at least part of the voucher is readable by an electronic device, which facilitates redemption of the voucher as it can be read directly by an electronic device.

When redeeming a voucher, the voucher manager may only transmit the portion of the voucher that is in an artificial language. Alternatively, the voucher manager may transmit the entire voucher.

By virtue of this aspect of the invention a portable terminal, such as a PDA or cellular telephone, is able to receive an electronic voucher, display a portion of the voucher that is in a natural language to a user, and redeem a voucher by transmitting at least the portion that is in the artificial language directly to an electronic device, such as a POS terminal.

The electronic voucher may be for use with financial services or products, retail services or products,

entertainment services or products (such as tickets for a cinema, theatre, or such like venue), or such like.

The wireless communication port may be an IrDA (Infra-red Data Association) compliant infra-red port, an rf transceiver, or any other convenient wireless communication device.

According to a ninth aspect of the invention there is provided a computer program element comprising computer program code to enable a portable terminal to receive an electronic voucher having a description of the voucher in a natural language and a description of the voucher in an artificial language, to discriminate between the natural language description and the artificial language description, to present the natural language description on a display associated with the portable terminal, and, in response to a request to redeem the voucher, to transmit at least the artificial language description.

These and other aspects of the invention will be apparent from the following specific description, given by way of example, with reference to the accompanying drawings, in which:

Fig 1 is a block diagram of a retail voucher management system in accordance with one embodiment of the present invention;

Fig 2 is a block diagram illustrating the architecture of a portable terminal used in Fig 1;

Fig 3 is a diagram illustrating the fields in an electronic data structure which forms an electronic retail voucher for use in the system of Fig 1;

Fig 4 is diagram illustrating some of the programs being executed by the components in the management system of Fig 1;

Fig 5 is a table illustrating entries in a database used in the management system of Fig 1;

Fig 6 is a block diagram of a voucher management system in accordance with an alternative embodiment of the present invention; and

- Fig 7 is a block diagram illustrating the architecture of a portable terminal used in Fig 6.

Referring to the Figs 1 to 5, Fig 1 is a retail voucher management system 10 comprising a voucher creating device 12 in the form of a host computer interconnected to a plurality of voucher issuing terminals 14 by a network 16 in the form of the Internet. The host 12 operates as an interactive server from which terminals 14 can download electronic vouchers, as will be described in more detail hereinafter.

The terminals 14 are physically remote from each other, but are shown in proximity in Fig 1 for clarity. Terminals 14 include an ATM 14a, an interactive television 14b, an information kiosk 14c, a personal computer (PC) 14d, and a cellular telephone having Internet access 14e.

The system 10 further comprises a portable voucher storage terminal 18 in the form of a Smart card, and a voucher receiving device 20 in the form of a retail PoS terminal. Typically, device 20 is also remote from terminals 14 and is also connected to host 12 via the Internet.

The Smart card 18 is shown in broken line adjacent to ATM 14a and in broken line adjacent to PoS terminal 20 to illustrate that the Smart card 18 is conveyed between ATM 14a

and PoS terminal 20 in use, as will be described in more detail hereinafter.

A block diagram of the architecture of the Smart card 18 is shown in Fig 2. Card 18 is a conventional Smart card, and has processing means 40 in the form of an 8-bit microprocessor and associated storage means 42 in the form of non-volatile EEPROM. The Smart card 18 also has ROM 44 and RAM 46.

The EEPROM 42 stores an interface application 48 for enabling the Smart card to interface with standard Smart card readers. Interface application 48 enables the Smart card to send, and respond to, conventional commands conforming to the ISO-7816 protocol.

EEPROM 42 also stores a simple file allocation table (FAT) 50 for recording the location and size of electronic vouchers 52 stored in the EEPROM 42. Individual electronic vouchers 52 are stored in the EEPROM 42. EEPROM 42 also stores an electronic voucher handling application 56 for receiving, managing, and transmitting electronic vouchers 52. The maximum number of electronic vouchers 52 that can be stored in the card 18 is determined by the size of the EEPROM 42.

Each of terminals 14 and device 20 is configured with Smart card reading and writing hardware and software for interfacing with Smart card 18. Such hardware and software is commercially available, for example from Microsoft Corporation (trade mark).

The data structure of an electronic voucher 52a is illustrated in Fig 3. Voucher 52a has two fields: a

description 62 of one or more properties of the voucher in a natural language, and a description 64 of one or more properties of the voucher in an artificial language. The natural language used is English, and the description 62 is stored in ASCII text. The artificial language used is a numeric representation of a barcode and is stored in binary format.

The English language description 62 relates to three properties of the voucher, namely: the offer provided by the voucher, in this embodiment 10p off a toothpaste having the brand name ABC; the expiry of the offer, in this embodiment 10th November 1999; and the terms and conditions that apply, in this embodiment a maximum of two vouchers may be tendered for each purchase.

The artificial language description 64 is equivalent to the three properties described in the English description 62. The numbers shown in Fig 3 are for illustration only, they are not a numeric representation of a recognised barcode equivalent of the English description 62. The artificial language description 64 also includes a reference to a Web page URL that contains text describing the voucher 52a.

When a voucher campaign is to be initiated, for example, by a product manufacturer, distributor, retailer, or such like, the campaign organiser stores a voucher creating program on the host 12, as shown in Fig 4.

The campaign organiser provides the voucher creating program 70 with a range of unique identifiers, one identifier for each electronic voucher 52 that may be created. The identifiers are in the form of a serial number. This sets the maximum liability for the campaign. The organiser also

provides the program 70 with a start date and a finish date for the voucher campaign, so that the program 70 will only create vouchers 52 between the start date and finish date. The organiser may set an expiry date for the electronic vouchers 52 that is different to the finish date.

The program 70 maintains a database of issued vouchers 52, as shown in Fig 5. In the database 80, there are five columns. The first column 82 indicates the type of voucher 52, the campaign organiser may use any convenient code to represent the different types of vouchers used. All vouchers 52a for a particular campaign (for example, 10p off ABC toothpaste) are of the same type. If a separate table is used for each campaign then this first column 82 is not required. However, if a single table is used for recording the status of different types of vouchers, then it is convenient to use this column 82.

The second column 84 indicates the serial number of the particular voucher that has been created, the serial numbers having previously been provided by the campaign organiser.

The third column 86 indicates the date/time of issue. Any convenient format may be used. Fig 5 illustrates the date:month:year:hour:minute:second format.

The fourth column 88 indicates IP address of the terminal 14 that issued the voucher.

The fifth column 90 indicates the status of the voucher, that is, whether the voucher has been redeemed or not.

In this embodiment, the campaign organiser provides vouchers 52a for ABC toothpaste (as shown in Fig 3).

The program 70 uploads a voucher 52a to a Web page 72 on the host 12. The Web page 72 includes text explaining the terms and conditions for using the voucher 52a. The Web page includes text that invites users to download the voucher 52a, and a graphical representation of the voucher 52a which, on selection, initiates downloading of the voucher 52.

In use, a cardholder inserts his Smart card 18 into a terminal (for example 14a) and the terminal 14a reads any electronic vouchers 52 stored on the Smart card 18 via a terminal interface 74. The terminal 14a also provides the user with a browser 76 having a pre-set link to the URL (uniform resource locator) for the Web page 72 on the host 12.

Terminal interface 74 interrogates the voucher application 56 to determine if any electronic vouchers 52 are stored on the Smart card 18. As card 18 has two vouchers 52 (Fig 2) stored thereon, the interface 74 displays the natural language description 62 (Fig 3) of each of these two vouchers on the Web browser 76. The Web browser 76 also invites the cardholder to connect to the host Web page 72 to view the electronic vouchers 52a that are available for downloading from there.

To download an electronic voucher 52a from the Web page 72, the cardholder operates ATM 14a to select the link to that Web page 72, and when the Web page is displayed the cardholder selects the graphical representation of the voucher 52a. The voucher 52a is automatically downloaded to ATM 14a. The voucher program 70 stores the IP address of the ATM 14a and the date/time of issue in its database. The voucher program 70 then creates another voucher 52a (having a

new identifier) and uploads this to the Web page 72. If the program 70 has used all of its allocated identifiers then it ceases creating vouchers 52a.

Once the ATM 14a has downloaded the voucher 52a, interface 74 co-operates with interface 48 to transfer the voucher 52a to the Smart card 18. Application 56 receives the voucher 52a and stores it in a convenient location in the EEPROM 42, and updates the FAT 50 accordingly. The cardholder then removes card 18 from the ATM 14a. The application 56 also performs management functions, so that, if a voucher is not redeemed before its expiry date is reached, then the application 56 automatically deletes the expired voucher, thereby providing space for downloading more vouchers to the Smart card 18.

At some later time the cardholder may wish to purchase one or more goods (such as ABC toothpaste) or services for which he has a voucher 52a. The cardholder goes to a retail outlet and selects his purchase (ABC toothpaste). When the cardholder is buying the toothpaste, he hands over the card 18 to the retailer's teller (card 18 may also be used to store the loyalty application for that retailer).

The teller inserts the card 18 into the PoS terminal 20 prior to, during, or after scanning the cardholder's items for purchasing. PoS terminal 20 reads the contents of the card 18 to determine whether the card 18 stores any valid vouchers 52 that can be redeemed against any of the items to be purchased. If some vouchers 52 are detected (in this embodiment, 10p off the purchase price of the ABC toothpaste), then these vouchers 52 are removed from the card 18 and the special offers provided by these removed vouchers

52 are credited to the cardholder's transaction (in this embodiment, the purchase price is reduced by 10p). The credit to the cardholder's transaction is referenced by the serial number of the electronic voucher 52a that was presented. The card 18 updates its FAT 50 to indicate that the toothpaste voucher 52a has been removed.

If an item is returned to the retailer for a refund, then the transaction is reviewed to determine if any voucher was used as part payment. If a voucher was used, then the voucher is transferred back to the Smart card 18, deleted from the PoS terminal 20 and the discounted cost is refunded to the cardholder.

If an item is returned to the retailer for a refund after the retailer has been recompensed by the campaign organiser, then the retailer may give the cardholder a refund of the full purchase price.

Upon completion of a transaction, or alternatively at the end of each day, the retailer redeems the vouchers which have been tendered. To redeem the vouchers, the PoS terminal 20 transfers the vouchers 52a to the host 12 using a secure client-server connection, such as SSL (secure sockets layer). On receiving the transferred vouchers 52a, program 70 updates the database 80 and credits the retailer with the appropriate sum of money (the value of the vouchers multiplied by the number of vouchers transferred). This may be achieved by electronic funds transfer to the retailer's bank account, or by any other convenient payment method.

In the event that the database 80 has already recorded one of the vouchers 52a as having been redeemed, the program automatically informs the campaign organiser so that the

organiser can determine whether payment should be made for that voucher, or whether a further investigation is required.

It will be appreciated that in this embodiment the campaign organiser has a great deal of control over the campaign. At any point in time the campaign organiser can determine the maximum liability (the number of issued vouchers multiplied by the value of each voucher). The organiser can also determine how many vouchers have been issued, to which issuing terminals the vouchers have been issued, and from which receiving devices 20 redeemed voucher claims have been received. This provides the organiser with statistical information for use in future voucher campaigns. For example, if a cardholder requests vouchers from the host 12 via a personal computer (terminal 14d), an interactive television (terminal 14b), or a cellular phone (terminal 14e) then for a future campaign, the host may email vouchers directly to the cardholder.

Referring now to Fig 6, which is a block diagram of a voucher management system 100 in accordance with an alternative embodiment of the present invention, the system 100 comprises an authorisation server 112 that includes a voucher creating device, the server 112 being interconnected to a plurality of voucher issuing ATMs 114 (only two of which are shown) by an ATM network 116. In addition to authorising ATM transactions, the server 112 operates as an interactive server from which ATMs 114 can download electronic vouchers, as will be described in more detail hereinafter. The ATMs 114 are physically remote from each other, but are shown in proximity in Fig 6 for clarity.

The system 100 further comprises a portable voucher storage terminal 118 in the form of a PDA, and a voucher receiving device 120 in the form of a retail PoS terminal. Typically, device 120 is also remote from ATMs 114 and is also connected to server 112 via the ATM network 116.

The PDA 118 is shown in broken line adjacent to one of the ATMs 114 and in broken line adjacent to PoS terminal 120 to illustrate that the PDA 118 is conveyed between an ATM 114 and a PoS terminal 120 in use, in a similar way as in the Fig 1 embodiment.

Referring now to Fig 7, which is a block diagram illustrating the architecture of the PDA 118 used in Fig 6, PDA 118 comprises a controller 212 and associated volatile memory 214 and non-volatile memory 216, a touch-sensitive display 218, a serial communication port 220 for receiving a connector, and a wireless communication port 222 in the form of an IrDA (Infra-red data association) compliant infra-red port.

In use, the controller 212 loads a simple operating system 226 and a voucher manager program 228 into the volatile memory 214. Controller 212 is responsible for the operation of the terminal 118, and is coupled to the display 218, serial port 220, and IR port 222.

When a voucher campaign is to be initiated, the campaign organiser stores a voucher creating program on the server 112. The campaign organiser provides the voucher creating program with a range of unique identifiers, one identifier for each electronic voucher that may be created.

The ATMs 114 can download vouchers from the server 112 on request from a user. The ATM then transfers the voucher to the user's PDA 118 via a wireless communication port (in this embodiment an IrDA compliant IR port) in the ATM 114. The PDA 118 receives this downloaded voucher via the IR port 222, and the voucher manager 228 stores the downloaded voucher in the non-volatile memory 216. As for the Fig 1 embodiment, each voucher comprises a description of the voucher in the English language, and a bar-code representation of the voucher for reading by an electronic device. The voucher manager program 228 discriminates between the English language portion and the bar-code portion of the voucher, and displays the English language portion to the user using display 218.

To redeem the voucher, the user takes the PDA 118 to the PoS terminal 120, which also has an IR port, and uses the voucher manager program 228 to transmit the voucher to the terminal 120. The voucher is then processed in a similar way as for the Fig 1 embodiment.

The voucher manager program 228 includes a housekeeping facility for determining the expiry date of each voucher and the length of time each voucher has been stored in the PDA 118. If a voucher is not redeemed prior to its expiry date then the voucher manager 228 automatically deletes the voucher. Similarly, the housekeeping facility can be programmed by the user to delete any voucher that has been stored for longer than a predetermined time period, for example, two weeks.

Various modifications may be made to the above described embodiments within the scope of the invention, for example,

in variants of the Fig 1 embodiment, the network may not be the Internet, but may be an extranet, an intranet, or other similar TCP/IP based network. In variants of the Fig 1 embodiment, the network may not be TCP/IP based. In variants of the Fig 6 embodiment, the portable terminal may be, for example, a cellular telephone. In other embodiments, the portable terminal may be used to fulfil electronic commerce transactions, so that the terminal that stores the vouchers also pays for the product or service being purchased. In variants of the Fig 1 embodiment, the Smart card may be any type of Smart device, such as a Smart ring, a Smart button, or such like.

In other embodiments, retail outlets such as supermarkets may equip their shopping trolleys with Smart card viewers so that cardholders can view the contents of their Smart cards (the electronic vouchers) as they are shopping. In other embodiments, terminals 14 may be operable to print out a list of the electronic vouchers 52 stored on the Smart card 18. In other embodiments, the terminals 14 may be operable to print out a shopping list including the items for which electronic vouchers 52 are held by the cardholder.

In other embodiments, each voucher may contain some code so that the voucher will self-delete if it is not used within a predetermined time period.

In other embodiments, an ATM may automatically download a voucher to a PDA 118 when the user of the PDA 118 requests a bank statement or other information that is conveyed using the wireless communication ports in the ATM and the PDA.

In other embodiments, a public access terminal other than an ATM, for example an information kiosk, may be used.

Claims

1. A self-service terminal for dispensing electronic vouchers, the terminal having a communication port for wireless transmission of electronic vouchers to a portable terminal operated by a user.
2. A terminal according to claim 1, wherein the terminal is operable to transmit a voucher together with information requested by the user.
3. A terminal according to claim 2, wherein the terminal is operable to transmit a voucher together with a receipt.
4. A terminal according to claim 2, wherein the terminal is operable to transmit a voucher together with a statement.
5. A portable terminal for use with the self-service terminal of claim 1, the portable terminal comprising a controller, a display, a wireless communication port, and an input device, characterised in that the portable terminal includes a voucher manager, whereby, the manager is operable to receive an electronic voucher from a self-service terminal, to present a graphical representation of the voucher on the display, and to transmit the voucher using the wireless communication port.



Application No: GB 0016581.1
 Claims searched: 1-5

Examiner: Dave McMunn
 Date of search: 25 October 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): G4T (TAE, TBX). G4V (VAK.).

Int Cl (Ed.7): G06F 17/60. G07F 7/10.

Other: ONLINE : WPI, EPODOC, JAPIO.

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X, P	GB 2,338, 329 A (FUJITSU). Note PDA 10 with transceiver 54 & check-out terminal 12 or stand alone kiosk 30 with read/writer 32. Note also 94, Fig 2 & lines 25-29, page 18	1,2
X	EP 0,612,019 A2 (LASER DATA). Note PDA 400 & computer 414 shown in Fig 4 & lines 28 to 48, page 12	1-3, 5
X	WO 99/08238 A1 (IBM). Note PDA 10, rf & ir ports 50, 54 & see line 25, page 15 to line 2, page 16.	1,3,4
X	WO 94/22116 A3 (SANTIGLIA). Note PDA, sensor S & line 9 on page 3	1,3, 4
X	US 5,380,991 (VALENCIA & HOWE). Note 64 in Fig 5 & description on lines 27-36, column 4	1
X	US 5,192, 854 (COUNTS). Note scanner 100 description & description of coupon kiosk 300 & especially lines 34-35, column 5 & lines 55-58, column 6.	1,2,5
X	US 4,454,414 (BENTON). Note PDA 20, optical transceivers 32, 34 & ATM description at lines 24 to 34, column 3	1,3,4

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



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| X Document indicating lack of novelty or inventive step | A Document indicating technological background and/or state of the art. |
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